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Maternal and perinatal outcomes of teenage pregnancies: A case control study

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Abstract

Background and objective: Teenage pregnancies are widely distributed in developing countries. Different adverse outcomes are reported for early marriage and teenage pregnancy. This study aimed to assess the maternal and neonatal outcomes of teenage pregnancy in Erbil city-Kurdistan region/Iraq.

Methods: From January 1 to June 30, 2024, 200 delivered women were participants of a case-control study at the Maternity Teaching Hospital in Erbil, Kurdistan region, Iraq. Of the 200 women, 100 were teenage cases and the remaining 100 were adult control participants. Both groups' maternal and perinatal outcomes were assessed.

Results: There was a significant difference between the teenage and adult delivered women in relation to age, body mass index, parity, miscarriage history and educational level. Intrauterine growth restriction and emergency cesarean section were significantly different. Gestational diabetes and preeclampsia were more prevalent in teenage pregnancies. Preterm labor, low birth weight and low APGAR scores after 1 and 5 minutes were more in teenage deliveries.

Conclusion: Teenage pregnancy is more likely to be accompanied by multiple adverse maternal and neonatal outcomes.

Keywords: Teenage pregnancy; Maternal out comes; Perinatal Outcomes.

Introduction

The teenage pregnancy is a disastrous public health problem in the entire world.(1) It is known as a gestation of girls in age group of 10-19 years. The world health organization defined the condition as the percentage of pregnant women aged 19 years or younger in a given period of time.(2) Globally, about twenty one million girls had teenage pregnancy and yearly two million girls in age of less than fifteen years are pregnant.(3) It was shown that over 90% of teenage pregnancies reported in low and middle-income countries. The early marriage (<18 years) represented about 28% of marriages in developing countries although legal and social efforts.(4)

In Iraq, the teenage pregnancy represented about 21.9% of all pregnancies in one center(5) and 5% of Iraqi girls had teenage pregnancy in age of less than 15 years, while 22% of them had teenage pregnancy in age of less than 18 years.(6) In Iraqi-Kurdistan region, prevalence of teenage pregnancy was increased in last decade's.(7)

Different factors played role in increasing rates of teenage pregnancy such as illiteracy, poverty, culture, religion, early sexual activity, low sexual knowledge and defective family planning programs. Despite international and national efforts, the rate of teenage pregnancy is still increased in all countries of the world.(8) Transitional phase from childhood to adolescence is accompanied by changes in girls anatomy, physiology, structure and psychology which are not enough to make them appropriate for pregnancy and leads

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to serious complications. Additionally, lowering age at menarche globally had a significant effect on sexual development and regarded as a risk factor for early marriage and teenage pregnancy.[9]

Maternal and neonatal outcomes of teenage pregnancy are different between world parts. In developing countries, the teenage pregnancy is highly related to multiple adverse outcomes such as low fetal birth weight, prematurity, preeclampsia and infectious diseases in comparison to adult women. In developed countries, poor health outcomes of pregnancies among adolescents were also reported preterm labor, low fetal weight and increased stillbirth and neonatal mortality rates.[10] Similarly, surgical intervention and operative vaginal delivery are common in adolescent pregnancies.[11] However, one study showed that the rates of cesarean section and instrumental vaginal delivery are low among teenage pregnancies as compared to adulthood pregnancies.[12]

Different literatures revealed many maternal and neonatal complications of teenage pregnancy which attributed to different variables like incomplete growth of teenage girls and poor nutrition that leads to improper fetal growth and development with different neonatal complications like anemia, prematurity and death.[13]

In contrast, some authors revealed that these adverse outcomes reported in teenage pregnancies are related to factors accompanying early marriage like poor socioeconomic status and low educational level which are not related to differences in biology of pregnancy between adulthood and adolescent pregnancies.[14]

Other authors failed to detect adverse outcome among adolescent pregnant female after receiving a proper antenatal and obstetrical care.[15] Generally, different obstetrical and perinatal complications are resulted from gestation of adolescent girls[16] that ranged from gestational hypertension, early rupture of membranes, eclampsia, intrauterine growth restriction, preterm birth, low Apgar scores and neonatal death.[11,17] This study aimed to assess the maternal and perinatal outcomes of teenage pregnancy in a tertiary hospital based setting.

Methods

A case-control study was conducted at Maternity Teaching hospital in Erbil city-Kurdistan region/Iraq for duration of six months from1st of January to 30th of June, 2024, on 200 delivered women, 100 were teenage cases and the remaining 100 were adult control participants. Both groups' maternal and perinatal outcomes were assessed. Teenage pregnancy was defined as a pregnancy in girls aged 10 to 19 years.[18]

Inclusion criteria were viable singleton pregnancy, and accept to participate in the study.

Exclusion criteria included multiple pregnancy, chronic medical diseases and women refused to participate.

Sample size: A convenient sample size of one hundred delivered teenage pregnancy used as a case group and two hundred adulthood pregnant women (aged 20 years and more) was used as study control.

Information regarding basic characteristics of the study the participants (age, body mass index, parity, miscarriage and educational level), maternal co-morbidities of study participants (gestational diabetes mellitus, preeclampsia, eclampsia, intrauterine growth restriction, oligohydraminous, congenital anomalies, hemoglobin level, placenta previa and preterm premature rupture of membranes), labour characteristics of study participants (mode of delivery, postpartum hemorrhage, hysterectomy and blood transfusion) and perinatal outcomes of study participants (prematurity, birth weight, fetal gender, Apgar scores at 1 & 5 minutes, neonatal intensive care unit (NICU) admission and stillbirths death). Maternal co-morbidities and labour characteristics were assessed by Senior Obstetricians in the hospital. Perinatal outcomes were assessed by Pediatrician in the hospital.

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Ethical approval:
The Research Protocol Ethics Committee of the Kurdistan Higher Council of Medical Specialties approved this study on 27th May 2024 (no.7). Informed consent was obtained from each woman who agreed to participate in the study at the time of first interview. All participants were assured that their information would be kept confidential and would be used for research purposes only. All interviews were conducted following the ethical standards of the Declaration of Helsinki for Ethical Principles for Medical Research Involving Human Subjects.

Statistical analysis:
The study statistics was accomplished through using statistical package of social sciences, version 26 and apply of chi-square or fissures exact tests for categorical variables and independent sample t-test for continuous variables with level of significance was 0.05 or less.

Results

The mean age of participants with teenage pregnancy was significantly younger (*P* <0.001). Participants with adult pregnancy were significantly obese *(P* = 0.01). The mean parity was significantly lower among teenage pregnant (*P* <0.001), while the miscarriage history was highly positive in adult pregnant (*P* <0.001). Illiteracy and low educational level was significantly related to teenage pregnant (*P* <0.001). (Table 1)

Table 1 Distribution of basic characteristics according to study groups

Variable	Study groups				*P-value*
	Teenage		Adult		
Age					<0.001
Mean±SD (years)	16.1±1.4		29.8±4.5		
Body mass index					0.01
Normal	52	52.0	72	36.0	
Overweight	34	34.0	80	40.0	
Obese	14	14.0	48	24.0	
Parity					
Mean±SD	0.5±0.3		2.1±1.1		<0.001
Miscarriage					<0.001
Yes	8	8.0	44	22.0	
No	92	92.0	156	78.0	
Educational level					<0.001
Illiterate	27	27.0	30	15.0	
Primary	41	41.0	38	19.0	
Secondary	32	32.0	88	44.0	
College/institute	0	-	44	22.0	

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Preeclampsia was significantly related to adult participants (*P* <0.001), while the intrauterine growth restriction was significantly prevalent among teenage participants (*P* = 0.007).

Gestational diabetes mellitus, eclampsia, oligohydraminous, congenital anomalies, hemoglobin level and early ruptured membranes were not significantly different between study groups (*P* >0.05). (Table 2)

Table 2 Distribution of maternal co-morbidities according to study groups

Variable	Study groups				P
	Teenage		Adult		
Gestational diabetes mellitus					0.07
Yes	2	2.0	16	8.0	
No	98	98.0	184	92.0	
Preeclampsia					**<0.001**
Yes	8	8.0	59	29.5	
No	92	92.0	141	70.5	
Eclampsia					0.13
Yes	13	13.0	14	7.0	
No	87	87.0	186	93.0	
Intrauterine growth restriction					**0.007**
Yes	14	14.0	9	4.5	
No	86	86.0	191	95.5	
Oligohydraminous					0.8
Yes	1	1.0	4	2.0	
No	99	99.0	196	98.0	
Congenital anomalies					0.8
Yes	1	1.0	1	0.5	
No	99	99.0	199	99.5	
Hemoglobin level					
Mean±SD (mg/dl)	10.8±1.6		10.5±1.4		0.09
Placenta previa					0.6
Yes	2	2.0	4	2.0	
No	98	98.0	196	98.0	
Preterm premature rupture of membranes					0.8
Yes	1	1.0	3	1.5	
No	99	99.0	197	98.5	

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There was a highly significant difference between both study groups regarding delivery mode (*P* <0.001), emergent cesarean section was prevalent among teenage pregnant, while elective cesarean section was prevalent among adult pregnant. The postpartum hemorrhage, hysterectomy and blood transfusion were not significantly different between study groups (*P* >0.05). (Table 3)

A significant difference between study groups was observed in regard to prematurity (*P* = 0.03); preterm neonates were prevalent among teenage pregnancy. There was a highly significant relationship between low fetal birth weight and teenage pregnancy (*P* <0.001). Means of Apgar scores after 1 & 5 minutes were significantly lower in teenage pregnancy (*P* = 0.003; *P* <0.001). The fetal gender, NICU admission and mortality of neonates were not significantly different between study groups (*P* >0.05). (Table 4)

Table 3 Distribution of labour characteristics according to study groups

Variable	Study groups				*P*-value
	Teenage		Adult		
Mode of delivery					<0.001
Vaginal delivery	58	58.0	75	37.5	
Elective CS	12	12.0	87	43.5	
Emergent CS	30	30.0	38	16.0	
Postpartum hemorrhage					0.8
Yes	1	1.0	3	1.5	
No	99	99.0	197	98.5	
Hysterectomy					0.7
Yes	0	-	1	0.5	
No	100	100.0	199	99.5	
Blood transfusion					0.6
Yes	2	2.0	4	2.0	
No	98	98.0	196	98.0	

Table 4 Distribution of neonatal outcomes in regard to study groups

Variable	Study groups				*P*-value
	Teenage		Adult		
	No.	%	No.	%	
Prematurity					0.03[S]
Yes	28	28.0	34	17.0	
No	72	72.0	166	83.0	
Birth weight					<0.001[S]
Normal	33	33.0	22	11.0	
Low	67	67.0	178	89.0	
Fetal gender					0.9 [NS]
Male	43	43.0	89	44.5	
Female	57	57.0	111	55.5	
Apgar score after 1 minute					0.003[S]
Mean±SD	7.2±1.3		7.8±1.8		
Apgar score after 5 minutes					<0.001[S]
Mean±SD	8±1.5		8.9±2		
NICU admission					0.5 [NS]
Yes	25	25.0	42	21.0	
No	75	75.0	158	79.0	
Mortality					1.0 [NS]
Yes	1	1.0	2	1.0	
No	99	99.0	198	99.0	

NICU: Neonatal intensive care unit

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Discussion

Globally, the rate of teenage pregnancies is increasing. These pregnancies have long term adverse impact not on health of mothers and neonates only, but on the whole community.[19]

In current study, general characteristics of both study groups like age, body mass index, parity and miscarriage history were significantly different. These findings are in agreement with different literatures revealed differences in general characteristics related to age difference between both study groups.[20,21] Our study showed that illiteracy and low educational level was significantly related to teenage pregnant. Similarly, Mohr et al[22] stated that low educational level of adolescents in low and middle income countries was related to high teenage pregnancy rate and poor outcomes of these pregnancies.

The maternal outcomes of teenage pregnancy in this study showed that intrauterine growth restriction was significantly prevalent among teenage participants. This finding coincides with results of prospective cross sectional study in Sri Lanka which reported higher incidence of intrauterine growth restriction in teenage pregnancy as compared to adult pregnancy that might be attributed to poor growth of teenage mothers.[23] However, our study showed higher preeclampsia rates in adult participants in comparison to teenage participants. This finding is consistent with results of previous prospective case-control study in Egypt.[1] Other maternal co-morbidities like gestational diabetes mellitus, eclampsia, oligohydraminous, congenital anomalies, hemoglobin level and early ruptured membranes were not significantly different between study groups. These findings are inconsistent with results of different literatures.[10,11] This inconsistency may be due to differences in health infrastructure and socioeconomic status between different communities in addition to differences in sample size and methodology between different literatures.

Present study found that emergent cesarean section was prevalent among teenage pregnant girls, while the cesarean section rate was higher in adult pregnant women. This finding is in agreement with results of recent cross sectional study in Egypt.[24] Inconsistently, the Swedish national survey reported that vaginal delivery and instrumental vaginal delivery were predominant in teenage pregnancies.[25] This inconsistency might be attributed to differences in antenatal and obstetrical care between different countries. In our study, the postpartum hemorrhage, hysterectomy and blood transfusion were not significantly different between study groups. These findings are similar to results of recent retrospective Spanish study.[26]

The current study found that preterm neonates were prevalent among teenage pregnancy. Similarly, a recent prospective cross sectional study carried out in Kurdistan region/Iraq reported higher rates of preterm birth among teenage pregnancy in comparison to adult pregnancy.[27] Many authors related the prematurity of neonates in teenage pregnancy to poor health and nutrition of mothers.[13] Our study found a highly significant relationship between low fetal birth weight and teenage pregnancy. This finding is parallel to results of many studies that represented low birth weight as the common neonatal adverse outcome of teenage pregnancy.[10,28] The means of neonatal Apgar scores after one and five minutes in our study were significantly lower among teenage pregnancies. This finding is consistent with results of retrospective hospital-based study in Slovakia which found low neonatal Apgar scores in teenage pregnancy as compared to adult pregnancy.[29]

Conclusion

This study concluded that teenage pregnancy is more likely to be accompanied by multiple adverse maternal and neonatal outcomes. The main maternal outcomes of teenage pregnancy

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are intrauterine growth restriction and instrumental vaginal delivery, while the main neonatal outcomes are prematurity, low birth weight and low Apgar scores.

Competing interests

The author declares that she has no competing interests.

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